

ATC-810

Twin Engine CPT/IFR Flight Simulator



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ATC's Realistic Flight Simulator

The low-cost, computer-chip-driven simulator that began life as the so-called "desk-top" simulator has grown to a new level of sophistication and usefulness with the introduction of the ATC-810.

Unlike earlier compact simulators designed to train pilots of singles and light twins, the ATC-810 is aimed at medium-twin pilots, including those flying Piper Navajos or Cessna 400 series aircraft in charter or commuter operations. Under new FAR Part 135, use of training devices has been clarified and the ATC-810 is intended to meet the requirements.

The ATC-810 does not simulate a specific aircraft but rather represents any turbocharged piston twin in the 6,500- to 8,000-pound class. Analog Training Computer of West Long Branch, New Jersey, claims a simulator duplicating a specific model of aircraft would cost nearly a half million dollars to build.

But by building a general simulator and seeking a larger market volume, the ATC-810 price is held to \$22,950.

The ATC-810 has virtually all of the controls found in a medium twin, including rudder pedals, cowl flaps, a fuel system, full instrumentation, an electrical system, etc. Functioning rudder pedals are unusual for this class of simulator, but aircraft operators told ATC that pedal pressure is necessary for realistic engine-out simulation.

A realistic fault creation system also is incorporated in the ATC-810. A remote control panel allows an instructor to simulate 23 aircraft system failures or problems much as they might occur in flight. For example, engine oil or cylinder head temperatures can be elevated to test the pilot's observation skills.

If the pilot fails to correct for high temperatures, the engine eventually will simulate a failure. All switches on the remote failure control panel operate silently so the instructor may stand behind a pilot and induce problems without tipping off the student that something is about to go wrong.

A very realistic navigation system stores actual navigation information in electronic memory chips. One chip can "memorize" every approach and enroute navigation feature for an area extending from New York to Philadelphia. Other chips will be available and can be programmed to customize the ATC-810 to an operator's specific geographical location. An optional plotter can be added to provide a trace of a pilot's performance of enroute navigation tasks.



Analog Training Computer's ATC-810 simulator represents any turbocharged piston twin in the 6,500- to 8,000-pound class and includes a fault system that can simulate 23 failures.

The ATC-810 has all the flight instruments and avionics normally found in medium twins, including an RMI and an optional HSI. ATC has installed its own radio faceplate with electronic frequency readouts so the boxes themselves do not represent any specific brand of avionics.

A rather realistic cockpit mockup houses the ATC-810, and an optional cover enhances the simulation. A copilot's seat can be added for crew training although all flight controls and instruments are located directly in front of the pilot.

When B/CA flew the ATC-810, we were impressed by attention to detail. Features such as a fuel system with cross-feed and two tanks per side, fully operational engine controls including mixtures and cowl flaps, and a reasonably natural control feel add much to realism. One feature that we did not believe would be important but turned out to be quite helpful is engine sound. The sound of the ATC-810's engines changes with power changes, engine failure and even out of synch props. Just as all children find it helpful to make motor sounds when they sit behind the wheel of dad's car, we found that the engine sounds in the 810 greatly enhanced the illusion of flight.

The number and complexity of the emergencies that can be simulated by the

ATC-810 are almost endless. Procedures that are dangerous in flight, particularly low-altitude engine failures, can be practiced realistically without risk. One B/CA editor crashed in the ATC-810 when the flaps split simultaneously with an engine failure at low altitude, convincing us that the system is capable of providing any pilot with more emergencies than he is likely to encounter in flight.

Analog Training Computers, 185 Monmouth Parkway, West Long Branch, N.J. 07644. Phone: (201) 870-9200.

John W. Olcott



The ATC Twin Trainer: Finding a Cheaper High For the Flying Pros

THE FAA HAS long acknowledged the value of type simulators in providing effective training for airline crews. Now the agency is paying more attention to the potential role of the simpler, motionless, class simulators in professional-pilot training programs. For instance, air-taxi and commuter operators may use training devices, as the FAA calls motionless simulators, to satisfy parts of the annual competency and biannual pilot-in-command instrument checks required under the new Part 135 of the Federal Aviation Regulations.

"Training devices have come a long way, and we wanted to give more recognition to them," says one FAA official.

Analog Training Computers' new ATC-810 twin-engine ground trainer has had a lot to do with that attitude. Designed as a class trainer representative of modern turbocharged twins with gross weights between 6,500 and 8,000 pounds, the -810 can simulate just about any emergency or navigational problem you could set up in, say, a Navajo or 421. The list includes some situations nobody would practice while airborne, such as a loss of control at Vmc and recovery at low altitude.

During a visit to ATC's complex in West Long Branch, New Jersey, I logged an hour and a half in an -810 and was amazed at the amount of realism the company has built into the trainer. You have to go through a lengthy prestart checklist, and there are hot- and flooded-start procedures to follow, if needed. Background noise changes according to power settings and synchronization. Relationships between power settings, control forces and attitude lack only seat-of-the-pants cues to create

an illusion of actual instrument flight.

How hard a pilot has to work during an -810 session depends on the instructor. By manipulating a console, he can instantly induce any one of 23 problems or failures—or combination thereof. Engine failure during takeoff, icing, asymmetric flap condition, landing gear not locked down, low oil pressure and alternator failure are a few of the gremlins at the instructor's command. Rheostat knobs on the controls allow him to select and adjust the degree of many conditions, including wind direction and velocity and turbulence.

I was surprised when an engine shutdown re-

sulted in yaw; quite a bit of rudder pressure was necessary to maintain directional control until I had time to spin the rudder-trim wheel. During a couple of single-engine ILS approaches, I had to retrim as airspeed changed. You can even encounter fuel exhaustion or starvation in the -810, but my instructor, ATC Flight Training Director Don Albanese, kindly started me off with enough fuel indicated in the four tanks.

For navigation work, the -810 comes equipped with a program that covers the low-altitude chart for the New York-to-Philadelphia area, including 153 instrument approaches. There are also cassette tapes to add air traffic control communications to the exercise. Other area programs are available as options, but ATC General Manager Tony Romano says that if you can do it all in the busy Northeast, you can do it anywhere. Additional options include a horizontal situation indicator and a plotter to record the track flown by the pilot.

With fuel prices where they are, the company thinks the -810 will appeal to flight-school operators for primary and advanced twin training as well as to Part 135 operators. Albanese claims the -810 consumes just three cents an hour in energy costs, although overall operating costs are higher than that. Base price of the ATC-810 is \$22,950.

The company expected to begin -810 deliveries this fall, and its people are armed with advice and forms with which to help operators develop training programs that incorporate FAA-approved use of the trainer. ATC is based at 185 Monmouth Parkway, West Long Branch, New Jersey 07764.

GERARD BRUDER, JR.

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LEARNING FROM THE GROUND UP

As fuel costs have increased, so have the predictions about the bright future of simulators. The use of ground-based training devices can lower the cost of training and currency requirements substantially. The AOPA Air Safety Foundation, for instance, started using procedures trainers instead of airplanes in some of its Instrument Refresher courses as an option, saving students not only the price of fuel, but the cost of aircraft rental as well.

New, more demanding requirements under Part 135 of the Federal Aviation Regulations for commuter and air-taxi pilots make the trainer market, especially the multi-engine market, promising.

Safety is another factor, as more emphasis is put on multi-engine accident prevention. Allowing pilots to simulate emergencies in a safe environment is one of the major advantages twin trainers offer. Their use should encourage the needed practice of maneuvers from which pilots might shy away in flight.

New multi-engine trainers are going into production to meet the expected increased demand. Technically, most of these machines are not true simulators but training devices, a distinction only vaguely defined by the Federal Aviation Administration. True simulators duplicate a particular model of aircraft, such as the Boeing 727 or the Beech 99, and its characteristics; a training device reflects the characteristics of a class of aircraft. Each device used for Part 135 training must be accepted individually by the FAA. Generally, more training is allowed in a true simulator than in a training device, because it is felt that the closer a machine represents a specific aircraft, the greater the transfer of learning. (The FARs detail maneuver-by-maneuver what type of trainer can be used.)

This month Analog Training Computers is introducing a new low-cost, cabin-class Twin-Engine Flight Simulator and Cockpit Procedures Trainer, the ATC-810. At a base price of \$22,950, it is less expensive than other multi trainers already on the market. Aviation Simulation Technology last year introduced a multi-engine-class trainer, at a base price of \$39,600. For eight years, Flightmatic has offered the F208 Flight Simulator Vista Twin, priced at \$34,000. (Flightmatic also makes a Cessna 421 simulator for \$72,000 and several single-engine and helicopter models.) Frasca Aviation's first multi-engine trainer, the Model 102, was built 13 years ago. It is being re-

placed by the \$60,000 Model 122. Frasca also offers a single trainer and other twins built to customers' specifications.

AOPA Pilot staff members recently "flew" the newer ATC and AST models briefly. The ATC 810 is designed as a turbosupercharged, piston-engine, 6,500-to 8,000-pound twin such as the Cessna 400 series, the Piper Navajo and Chief-tain and the Beech Duke and Baron. ATC Vice President Anthony Romano pointed out that the Model 810 can be used for lighter twin primary training, as well as for cabin class.

Aside from the fact that there is no motion and you can turn down the volume to get rid of the engine noise, it operates like an airplane. An instrument landing system approach on my initial try was uneventful. Response to minor corrections was good, and I had no trouble keeping the optional horizontal situation indicator (HSI) lined up. The simulator can be positioned at any point along the programmed route, so one can shoot an approach at Teterboro, New Jersey, and shortly find himself flying down the glideslope at LaGuardia. The 810 comes with a preprogrammed navigational package that covers 65 airports and 153 approaches in the New York/Philadelphia corridor. Buyers of the device can get an extra nav program for their local area as well.

When the 810 suffered an engine failure on a later flight, simulated by the ATC instructor, the amount of pressure needed for a real ailing twin was required on the left rudder to maintain the heading. The 810 is designed to require up to 150 pounds of foot pressure.

In a demonstration of Vmc (minimum control speed with critical engine inoperative), I managed to keep upright as the airspeed indicator crept up to red-line, although hefty rudder pressure was needed to maintain control. (The 810 neatly demonstrates what happens when control is lost by going inverted.)

Some 23 different emergency situations can be fed in by the instructor, from an instantly inoperative landing gear to loss of oil pressure on approach.

Options for the 810 include the \$1,950 HSI and a \$2,010 flight plotter that records a student's meanderings all over a course. The price of the extra nav program has not yet been determined.

ATC is located at 185 Monmouth Parkway, West Long Branch, New Jersey 07764.

Aviation Simulation Technology's 300 Series twin trainer has the capability of adding new functions as they are designed. The latest development from AST is a display that depicts objects on the ground for reference, a runway and even a ceiling to break through on the approach. (The system is a prototype and is distracting at first.) Flying the trainer without the display, we found that although control movements produce the proper response in the panel instruments, the control wheel produces little pressure. Rudder pressure during simulated engine out was not forceful either.

The 300 panel is modeled after a Mooney panel and features King Microline avionics. RNAV is standard. The plotter, instructor console and computer-generated display are options. Programs for 25 navigational areas are available. The device can be converted to a single-engine trainer by changing the throttle quadrant and a couple of instruments.

AST is located at Hanscom Field East, Bedford, Massachusetts 01730; telephone is 617/274-6600. The company also produces a single-engine model.

Frasca Aviation's new Model 122 is just going into production. "We make it a policy to prove a new design in numerous selected locations and extreme conditions before promoting it," said Rudy Frasca.

The basic Model 122, a training device, can be adapted to the specifications of a certain twin, said Frasca. The gross weight and center of gravity can be changed, and airspeed and manifold pressure will react properly during engine-out and shut-down procedures. Frasca Aviation can add a flight director to the basic trainer and other features "within reason." The company's Model 210 twin is a side-by-side simulator that duplicates a customer's specific numbers for a Cessna 310, a Beech Baron, a Beech 99 and so forth.

Frasca Aviation is located at 606 South Neil Street, Champaign, Illinois 61820; telephone is 217/359-3951.

Flightmatic's F208 Vista Twin can be converted to a single-engine, high-performance training device. It has a visual system that displays a ground view and an IFR plotting chart and is equipped for both VFR and IFR training. The instructor can change wind direction and velocity, control fuel quantity and induce systems and avionics failures.

Flightmatic is located at 150 Riser Road, Teterboro Airport, Teterboro, New Jersey 07608; the telephone number is 201/933-5134.

Mary F. Silitch